REMARKS

Applicant has carefully reviewed and considered the Final Office Action mailed on June 26, 2003, and the references cited therewith.

Claim 1 is amended, claim 2 is canceled, and no claims are added; as a result, claims 1, 4-7, 9-28 are now pending in this application.

§103 Rejection of the Claims

The office action states that claims 1, 2, 4, 6, 7, 14, 15, 17, and 19 were rejected under 35 USC § 102(b) as being anticipated by Bollard, et al. (U.S. Publication No. US004845495A) in view of Woodgate, et al. (U.S. Publication No. US005917562A) and Hayes, et al. (U.S. Publication No. US006112140A). Applicant presumes the Examiner did not intend 102(b) based on the heading in the office action and the use of multiple references. Accordingly, the response presented is intended to address a 103 rejection for claims 1, 2, 4, 6, 7, 14, 15, 17, and 19.

The Examiner remarks that;

> Hayes teaches a flight management system providing for automatic control display unit (CDU) backup utilizing structured data routing. Hayes teaches that in the prior art systems the failure of one display would cause an undue burden on the pilot with the remaining operative display and that automatically providing the display on a redundant backup unit would relieve this burden. (Column 4, lines 50-56).

As described in Hayes, a CDU includes an upper face portion 34 and a lower face portion. The upper face portion includes an electronic display which is capable of displaying lines of text entered by the flight crew. (Column 2, lines 59-65). The CDU is not a display which graphically illustrates to the pilot important flight information. Hayes recognizes that the graphical presentation is provided by a main instrument panel 140 which includes left and right primary flight displays 142, 144, left and right navigation displays 146, 148 and a central engine and crew altering display 149. CDUs are used to enter flight plans. Hayes does not mention a reversionary display or reversionary mode to present backup information for

airspeed, attitude, altitude, communication, navigation, and engine data on one display. Indeed, nowhere in Hayes is mention made of a multifunction display. Instead separate displays are dedicated as primary flight displays 142, 144, left and right navigation displays 146, 148 and a central engine and crew altering display 149. Hayes only discusses providing a redundant CDU 120 and routing data from a malfunctioned CDU, 112 or 114, to a redundant CDU 120.

In contrast, Applicant's independent claim 1, as amended, recites a display having a "reversionary mode" which graphically provides a backup presentation of a set of important flight information data for airspeed, attitude, altitude, communication, navigation, and engine data on a particular display. In Hayes, such data is provided on separate displays, e.g. the primary flight displays 142, 144, the navigation displays 146, 148, and the central engine and crew altering display 149. No mention is made in Hayes about any display failure, but rather only the failure of a CDU. No teaching or suggestion is made in Hayes to graphically present these various types of flight information data on one display in a "reversionary mode." Hayes simply does not address anything beyond routing data between CDUs.

Bollard appears to describe a redundant pair of mission computers. Bollard illustrates separate devices for communications, navigation, and equipment sensors. That is, Bollard includes a pair of electronic attitude/director indicators (EADI), a pair of electronic horizontal situation indicator (EHSI), a pair of multifunction displays (MFDs) to assist in the control and monitoring of the aircraft subsystems and avionics equipment.

Bollard does not describe a single reversionary display to provide a backup presentation of communication, navigation, and equipment sensor settings. Nothing is taught or suggested in Bollard regarding providing a graphical backup presentation of the contents of any one of these multiple displays on another display if a given display should fail since there are already two sets to every display.

Nor does Bollard recite automatically providing such a backup presentation on a reversionary display should one or more of the devices of the redundant pair go down. Since each separate display has redundancy no action is needed. Hayes does not cure this deficiency since Hayes only describes re-routing CDU data if a CDU fails.

The Examiner appears to apply Woodgate for purposes of teaching a "reversionary" display. Woodgate describes an autostereoscopic display that includes;

> an illumination source for producing light of a first polarization and light of a second polarization different from the first polarization. (See Abstract).

As the Examiner notes, this may be useful so that the display may be viewed at a wide range of angles. (Column 18, lines 60-67). The Examiner cited text reads;

> It is also possible to operate the display as a reversionary high resolution two dimensional display. In this case, the spatial light modulator displays a single two dimensional image using all of the pixels. For this type of operation, backlight maybe switched from autostereoscopic operation to a Lambertian source, for instance using an element of the type shown in FIG. 24, so that the display may be seen from a wide range of viewing angles.

The Woodgate reference appears to describe;

> A switchable display capable of displaying autostereoscopic images visible from a relatively small range of viewing positions or stereoscopic images visible from a relatively large range of viewing positions. (Column 18, lines 10-13).

Thus, Woodgate uses the term "reversionary" to describe two different views and has nothing to do with providing a graphical backup presentation of a set of important flight information data, including airspeed, attitude, altitude, communication, navigation, and engine data, upon the failure of one or more primary instrument displays.

Applicant's independent claim 1, as amended, recites;

> a display adjacent to the bezel and having a reversionary mode to automatically provide a graphical backup presentation of a set of important flight information data, including airspeed, attitude, altitude, communication, navigation, and engine data, upon the failure of one or more primary instrument displays.

Thus, unlike Bollard, Woodgate, and/or Hayes, Applicant's independent claim 1, claims a single display having a reversionary mode to automatically provide a graphical backup presentation of a set of important flight information data, including airspeed, attitude, altitude, communication, navigation, and engine data,

upon the failure of one or more primary instrument displays. The Applicant's claimed "reversionary display" and "reversionary mode" are carefully defined throughout the specification. For example, in the specification on page 21, line 17 through page 22 line 20 the text reads;

> According to the teachings of the present invention, and as shown in Figure 3, if either one of the MFDs 100 and 200 in the cockpit instrument system fails, the other MFD which remains functional will present all of the most important flight information data within its display 340. That is, the remaining MFD, shown in **reversionary mode** as MFD 300 in Figure 3, will present the important flight information, including airspeed, attitude, altitude, a heading indicator, communication and navigation frequency settings, and the like in a similar format to that shown previously on the PFD 100 of Figure 1. In Figure 3, the primary display 340 of the MFD 300 includes the many pieces of flight information data from the PFD. That is, the display includes one or more inset displays, e.g. inset 350, as well as a number of graphical information overlays, e.g. 360, 370, 380 and 390. According to the teachings of the present invention, the display inset 350 and the graphical information overlays, 360, 370, 380 and 390, **mirror those** illustrated and described in detail above in connection with the PFD 100 of Figure 1. Display inset 350 provides a navigation view and graphical information overlays, 360, 370, 380 and 390 provide flight information data indicators, which include airspeed 360, attitude 370, altitude 380, and heading 390. In this invention, the display 340 on MFD 300 is additionally referred to as a reversionary screen or **reversionary display** 340.
>
> According to the teachings of the present invention, the reversionary mode MFD 300 additionally includes engine data 301 within the display 340 which was originally provided on the NAV display 200 of Figure 2. In the embodiment of Figure 3, engine data is displayed within a vertical column 301 on the display 340 of MFD 300 in a similar format to that shown previously on the MFD 200 of Figure 2. However, as discussed previously the engine data displayed within a vertical column 301 on MFD 300 does not necessarily have to be displayed as within a vertical column and other presentations of this data, such as within a horizontal column are considered within the scope of the present invention. However, it is recognized that such engine data is important flight information and it is desirable that the same be presented in similar format to that which was previously provided to the pilot of an aircraft before an MFD failure and hence the format shown in the reversionary mode format of MFD 300 in Figure 3.

Applicant's independent claims 1, 7, and 15 each contain limitations to the reversionary capability of a display as clearly defined by the specification. None of the cited references, either independently or in combination, teach or suggest each and every element and limitation of these independent claims. Accordingly, reconsideration and withdrawal of the 103 rejection for these claims, as well as those which depend therefrom, is respectfully requested in view of the above remarks.

The office action states that claims 1, 2, 4-7, and 9-28 were rejected under 35 USC § 102(b) as being anticipated by the Honeywell Primus Epic (Epic) avionics system (Al Ditter, An Epic in the Making, Commuter World, December 1996-January 1997, pages 16, and 18-21; William B. Scott, Pentium Powers 'Epic' Integrated Avionics, Aviation Week & Space Technology, November 18, 1996 pages 67-69; James Holahan, LCDs, Mice on the Flight Deck!, Aviation International news, November 1, 1996, pages 56-58; Fred George, Introducing Primus Epic, Business & Commercial Aviation, November 1996, pages 116, and 118-120) in view of Woodgate, et al. (U.S. Publication No. US005917562A) and Hayes, et al. (U.S. Publication No. US006112140A). Again, Applicant presumes the Examiner did not intend 102(b) based on the heading in the office action and the use of multiple references. Accordingly, the response presented is intended to address a 103 rejection for claims 1, 2, 4-7, and 9-28.

These references, as applied to the above claims suffer from the same deficiencies addressed in connection with Bollard, Woodgate, and Hayes. That is, none of the references, either independently or in combination, teach or suggest "a display having a reversionary mode or reversionary capability," as claimed. As claimed, the "reversionary mode or reversionary capability" of a display can provide "a graphical backup presentation of a set of important flight information data, including airspeed, attitude, altitude, communication, navigation, and engine data, upon the failure of one or more primary instrument displays." For the reasons presented above, reconsideration and withdrawal of the 103 rejection for these claims is respectfully requested in view of the above remarks.

Further, Applicant notes that at least in connection with independent claim 7 no attention has been given to the Applicant's previous response amendment thereto.

In the Applicant's previous response, claim 7 was amended to recite that important flight information data can be provided to either a first or a second cockpit instrument panel, "in a substantially similar format size, location, and perspective when one of the first or the second cockpit instrument panels fail, in a backup mode." And, claim 15 was amended to recite that "both the PFD and MFD are adapted to display full flight information data in an identical format and size, in a reversionary mode, automatically if either the PFD or MFD in inoperable."

The Examiner stated that the combination of Bollard and Woodgate do not teach that the backup display is provided in a substantially similar format size, location and perspective. The Examiner then went on to apply Hayes as teaching a flight management system providing for automatic CDU backup utilizing structured data routing.

As noted above, there is no teaching in Hayes for replacing failed primary flight displays 142, 144, failed navigation displays 146, 148, or a central engine and crew altering display 149. Hayes only addresses routing data from a failed CDU, capable of displaying lines of text entered by the flight crew, to a redundant CDU. No mention is made of displays themselves failing or replacing the graphical content of a remaining display with the content of the failed display in a substantially similar format size, location, and perspective as was provided the display which failed. Applicant's Figure 3, and independent claims cover this ability.

Applicant respectfully submits that the specification clearly supports the Applicant's use of the terms "reversionary" display and "reversionary mode." The Applicant's use is clearly related to a backup mode function. This stands in contrast to Woodgate which says nothing about a backup display, but rather only discusses switching between stereoscopic and two dimensional displays.

Lastly, Applicant respectfully traverses the Examiner's statement in the Response to Arguments that showing "communication, navigation, and equipment sensor settings on one backup display is typical of the state of the art in aircraft display systems." None of the references teach or suggest such a capability. As described above, Bollard and Hayes each clearly define a myriad of different displays for these three different functions. Bollard, shows a pair of electronic attitude/director indicators (EADI) to provide attitude and direction, a separate pair

of electronic horizontal situation indicator (EHSI) to display compass information, and a separate pair of multifunction displays (MFDs) to assist in the control and monitoring of the aircraft subsystems and avionics equipment. Hayes similarly shows separate primary flight displays 142, 144, navigation displays 146, 148, and central engine and crew altering display 149.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 659-9340.

If necessary, please charge any additional fees or credit overpayment to the Deposit Account No. 501-791. **Additionally, please direct all future correspondence regarding this case to: 1200 E. 151ST ST., OLATHE, KS 66062, ATTENTION: DEVON A. ROLF.**

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS AF Commissioner for Patents, P.O. BOX 1450 Alexandria, VA 22313-1450, on this 26th day of August, 2003.

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